REMARKS

Reconsideration and allowance of the present application are respectfully requested in light of the amendments above and the remarks that follow.

In the Office Action, the Examiner asserted the following rejections of claims 1-8, 10-17, 19-27 and 29-37:

- claims 13, 18, 27, 28, 37 and 38 were rejected under 35 U.S.C. § 112, second paragraph for allegedly being indefinite;

- claims 10-12, 14, 17, 29, 30, 33, 36 and 37 were rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over "Mosaic Image Method: A Local And Global Method" by Li Zhao and Yee-Hong Yang ("*Zhao*") in view of "Eigenfaces vs. Fisherfaces: Recognition Using Class Specific Linear Projection" by Peter N. Belhumeur, João P. Hespanha, and David J. Kriegman ("*Belhumeur*");

- claims 1-3, 5, 8, 19, 20, 23, 26 and 27 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the purported combination of *Zhao* and *Belhumeur* in view of "Generalized Discriminant Analysis Using a Kernel Approach" by G. Baudat and F. Anouar ("*Baudat*");

- claims 15, 16, 34 and 35 were rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of "Multiresolution Eigenface-Components" by A.Z. Kouzani, F. He, and K. Sammut ("*Kouzani*");

- claims 6, 7, 24 and 25 were rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao, Belhumeur , Baudat* in view of *Kouzani*;

- claims 13 and 31 were rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of U.S. Patent No. 6,567,771 to *Erdogan et al.* ("*Erdogan*");

- claims 4 and 21 were rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao*, *Belhumeur*, and *Baudat* in view of *Erdogan*;

- claim 32 was rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of U.S. Patent Application Publication No. 2004/0066953 to *Bock*; and

- claim 22 was rejected under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao*, *Belhumeur*, and *Baudat* in view of *Bock*.

Applicant gratefully acknowledges the Examiner's indication that claims 9, 18, 28 and 38 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

By this Amendment, Applicant has amended claims 13, 18, 26-28 and 36-38 to correct informalities, and not for any reasons of patentability. Claims 1-38 are pending in this application.

Rejections of Claims 13, 18, 27, 28, 37 and 38 Under 35 U.S.C. § 112, Second Paragraph

Applicant has amended claims 13, 18, 27, 28, 37 and 38 to address the concerns expressed by the Examiner. (Office Action, p. 3.) In light of the amendments to claims 13, 18, 27, 28, 37 and 38 (*see supra*), Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 13, 18, 27, 28, 37 and 38 under 35 U.S.C. § 112, second paragraph.

Rejection of Claims 10-12, 14, 17, 29, 30, 33, 36 and 37 Under 35 U.S.C. § 103(a)

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the applied references, taken alone or in combination, must teach or suggest each and every element recited in the claims. (*See* M.P.E.P § 2143, (8th ed., rev. Aug. 2006.)) Applicant respectfully traverses the rejection of claims 10 under 35 U.S.C. § 103(a) because the Examiner's rejection based on the *Zhao* and *Belhumeur* fails in this regard.

Zhao discloses a method for performing image recognition system using principal component analysis ("PCA"). The method includes slicing images into a mosaic of equal-sized images; generating local eigenvectors using "PCA", and forming global eigenvectors are formed from the local eigenvectors. (*Zhao*, p. 1423, ¶ 3.) Image recognition is performed based on global eigenvectors by comparing training images with a test image. (*Zhao*, p. 1427, § 5.)

More specifically, in *Zhao*, a vector $v_{i,j}$ is generated by raster scanning the mosaic images. (*Zhao*, p. 1424, ¶ 1.) By concatenating these vectors, a vector V for the whole image is produced. (*Id.*) Then, applying PCA to each mosaic $v_{i,j}$, local eigenvectors $\Phi_t^{i,j}$ are computed. (*Zhao*, p. 1424, ¶ 2.) By concatenating eigenvectors $\Phi_t^{i,j}$ according to the relative positions of the corresponding mosaic images, global eigenvectors Φ_t are generated. (*Id.*) Thus, the method disclosed by *Zhao* includes <u>PCA</u> to generate local eigenvectors $\Phi_t^{i,j}$ from mosaic images. However, the global eigenvector Φ_t is generated by <u>concatenation</u> and not by PCA or other such algorithim.

Applicant's claim 1 recites "<u>a first LDA transformation unit</u> for LDA transforming the divided facial components into component descriptors of the facial components; a vector

synthesis unit for synthesizing the transformed component descriptors into a single vector; <u>a second LDA transformation unit</u> for LDA transforming the single vector into a single face descriptor" (emphasis added)." The Examiner apparently asserts that *Zhao* steps of computing local eigenvectors $\Phi_t^{i,j}$ by PCA and combining local eigenvectors $\Phi_t^{i,j}$ into a global eigenvector corresponds the claimed "LDA transforming the divided facial components into component descriptors" and "synthesizing the transformed component descriptors into a single vector," respectively. However, nowhere does *Zhao* disclose or suggest the claimed "<u>second LDA transforming unit</u> for LDA transforming the single vector into a single face descriptor" (emphasis added), as recited in Applicant's claim 10.

Belhumeur does not overcome this deficiency of *Zhao*. *Belhumeur* provides a comparison of various algorithms for performing facial recognition. The Examiner apparently relies on *Belhumeur* for its alleged teaching that LDA may be substituted PCA for facial recognition. (Office Action, p. 5:5-11.) However, *Belhumeur* does not disclose or suggest the above-noted feature missing from *Zhao*. Accordingly, *Zhao* and *Belhumeur*, taken alone or in combination, fail to disclose or suggest each and every feature recited in claim 1 and, therefore, cannot support a rejection of claim 1 under 35 U.S.C. § 103(a). Claims 11, 12, 14 and 17 depend from claim 10. Accordingly, these claims are patentable over the *Zhao* and *Belhumeur* at least due to their dependence from claim 10.

Claim 29, although of different scope than claim 10, recites features similar to those recited in claim 10. Accordingly, claim 29 is patentable over the purported combination of *Zhao* and *Belhumeur* for the same reasons as set forth above with regard to claim 10; and claims 30, 33, 36 and 37, which depend from claim 29, are also patentable.

Rejection of Claims 1-3, 5, 8, 19, 20, 23, 26 and 27 Under 35 U.S.C. § 103(a)

Claim 1 recites, *inter alia*, "<u>a Linear Discriminant Analysis (LDA) transformation unit</u> <u>for LDA transforming</u> the divided facial components into component descriptors of the facial components; a vector synthesis unit for synthesizing the transformed component descriptors into a single vector; [and] <u>a Generalized Discriminant Analysis (GDA) transformation unit</u> <u>for GDA transforming</u> the single vector into a single face descriptor" (emphasis added). Thus, similar to Applicant's claim 10, claim 1 recites two transformations - a LDA transformation and a GDA transformation. However, as argued above with regard to claim 10, *Zhao* only discloses one transformation and *Belhumeur* does not cure this deficiency. Thus, for the same reasons provided above with regard to claim 10, *Zhao* and *Belhumeur* fail to teach or suggest the above-noted features of claim 1.

The addition of *Baudat* does not cure the deficiencies of *Zhao* or *Belhumeur*. The Examiner apparently cites *Baudat* for the reference's alleged teaching of using GDA instead of LDA. (Office Action, p. 9:6.) *Baudat*, however, does not disclose or suggest performing <u>both</u> "LDA transforming the divided facial components into component descriptors of the facial components" <u>and</u> "GDA transforming the single vector into a single face descriptor." nor does the Examiner make such an assertion. (Office Action, p. 9:6-11.) Thus, *Zhao*, *Belhumeur* and *Baudat*, taken alone or in combination, cannot support a rejection of claim 1 under 35 U.S.C. § 103(a). The applied references also cannot support a rejection of claims 2, 3, 5 and 8 at least due to these claims' dependence from claim 1.

Claim 19, although of different scope than claim 1, recites features similar to those recited in claim 1. Accordingly, *Zhao*, *Belhumeur* and *Baudat* also cannot support a rejection of claim 19 under 35 U.S.C. § 103(a), as well as claims 20, 23, 26 and 27 which depend from claim 19.

Rejection of Claims 15, 16, 34 and 35 Under 35 U.S.C. § 103(a)

Claims 15, 16, 34 and 35 depend form claims 10 and 29 and, therefore, include all the limitations recited in the claim from which they depend. The purported combination of *Zhao* and *Belhumeur* fails to teach "LDA transforming the divided facial components into component descriptors of the facial components" and "LDA transforming the single vector into a single face descriptor," as recited in claims 10 and 29. (*See supra.*) The Examiner relies on *Kouzani* for the reference's alleged disclosure of "dividing face components, in different features, which partially overlap each other." (Office Action, p. 10:15-16, *citing Kouzani*, Fig. 2.) *Kauzani* does not disclose or suggest the above-noted features of claim 10 and 29 missing from *Zhao* and *Belhumeur*; and the Examiner does not assert that *Kouzani* makes such a disclosure. Accordingly, *Zhao* and *Belhumeur* and *Kouzani*, taken alone or in any proper combination, do not support of a rejection of claims 15, 16, 34 and 35 under 35 U.S.C. § 103(a).

Rejection of Claims 6, 7, 24 and 25 Under 35 U.S.C. § 103(a)

Zhao, *Belhumeru*, *Baudat* and *Kouzani* fail to teach or suggest each and every feature recited in claims 1 and 19. (*See supra.*) Thus, these references also fail to teach or suggest the features recited in claims 6, 7, 24 and 25 which depend from claims 1 and 19. Accordingly, when taken alone or in any proper combination, *Zhao*, *Belhumeur*, *Baudat* and *Kouzani* fail to teach each and every feature recited in claims 6, 7, 24 and 25. Accordingly, these references cannot support a rejection of claims 6, 7, 24 and 25 under 35 U.S.C. § 103(a).

Rejection of Claims 6, 7, 24 and 25 Under 35 U.S.C. § 103(a)

Claims 13 and 31 depend from claims 10 and 29 and, therefore, include all the limitations recited in the claim from which they depend. The purported combination of *Zhao*

and *Belhumeur* fails to teach "LDA transforming the divided facial components into component descriptors of the facial components" and "LDA transforming the single vector into a single face descriptor," as recited in claims 10 and 29. (*See supra.*) The Examiner relies on *Erdogan* for its alleged disclosure of using a transformation matrix. (Office Action, p. 12:12-18.) However, *Erdogan* does not disclose, nor does the Examiner allege that *Erdogan* discloses, the above-noted features of claim 10 and 29 missing from *Zhao* and *Belhumeur*. Accordingly, when *Zhao*, *Belhumeur* and *Erdogan* are taken alone or in any proper combination, these references cannot support a rejection of claims 13 and 31 under 35 U.S.C. § 103(a).

Rejection of Claims 4 and 21 Under 35 U.S.C. § 103(a)

Claims 4 and 21 depend from claims 1 and 19, respectively, and therefore include all the limitations recited in the claim from which they depend. The purported combination of *Zhao*, *Belhumeur* and *Baudat* fails to teach each and every features in claims 1 and 19. (*See supra.*) In addition, as noted above with regard to claims 10 and 29, *Erdogan* does not cure the deficiencies of *Zhao*, *Belhumeur* or *Baudat*; nor is *Erdogan* relied on for such disclosure. Accordingly, when *Zhao*, *Belhumeur*, *Baudat* and *Erdogan* are taken alone or in any proper combination, these references fail to support a rejection of claims 4 and 21 under 35 U.S.C. § 103(a).

Rejection of Claims 22 and 32 Under 35 U.S.C. § 103(a)

Claims 22 and 32 depend from claims 19 and 29, respectively, and therefore include all the limitations recited in the claim from which they depend. As argued above with regard to claims 19 and 29, *Zhao*, *Belhumeur*, and *Baudat* fail to teach or suggest each and every feature in claims 19 and 29. *Bock* does not cure the deficiencies of *Zhao*, *Belhumeur*, and *Baudat*. *Bock* is apparently relied on by the Examiner for it alleged disclosure of "outputting

face images of the identified face person." (Office Action, p. 14:6-7, *citing Bock*, p. 1, ¶ 5.)

Bock, however, does not cure the aforementioned deficiencies of *Zhao, Belhumeur*, and

Baudat, and the Examiner does not assert that *Bock* makes such a disclosure or suggestion.

Accordingly, when *Zhao, Belhumeur, Baudat* and *Bock* are taken alone or in any proper

combination, these references fail to support a rejection of claims 22 and 32 under 35 U.S.C.

§ 103(a).

Conclusion

In light of the foregoing, Applicant respectfully submits that claims 1-38 are in

condition for allowance, and requests reconsideration and allowance of the above-captioned

application. Should any residual issues exist, the Examiner is invited to contact the

undersigned at the number listed below.

It is believed that this Response and Amendment does not require additional fees.

However, if additional fees are required for any reason, please charge Deposit Account No.

02-4800 the necessary amount.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: <u>September 11, 2007</u>   By: _____

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